



MATHS

AT THE

MOVIES



SACSA: Middle Years Mathematics

Strand	Outcomes	Evidence	Achieved		Strand	Outcomes	Evidence	Achieved	
Number	3.6 Represents and analyses relationships amongst number concepts and uses these to make sense of, and represent the world. [In] [T] [KC1] [KC2]	analyses and uses fractions, decimals and common percentages to represent proportions of collections, measurements, sets of data and amounts of money [T] [KC1]		Q1	Measurement	3.5 Uses a range of standard tools to measure relationships between distances and other measurable attributes to calculate size. [T]	recognises relationships between measurable attributes of figures and objects, and communicates these relationships in both everyday and mathematical language [In] [C] [KC2]		Q7
				Q2					Q8
				Q3					Q9
				Q16					Q21
									Q22
Number	3.7 Describes, represents and analyses operations with rational numbers and relationships between them. [In] [T] [C] [KC1] [KC2]	deconstructs numbers into smaller parts and recombines them in different ways using patterns, rounding to groups of 10 and 100, and place value relationships [In]		Q4	Spatial Sense and geometric reasoning	3.14 Produces, uses and critiques scaled maps and plans and envisages alternative possibilities. [F] [T] [KC3]	describes and represents the same location from different reference points [C] [KC1] [KC2]		Q10
				Q5					Q17
									Q18
				Q6					Q19
									Q20
Number	3.8 Uses a variety of estimating and calculating strategies with whole numbers, including memorising multiplication and division facts, fractions and decimals. [T] [KC6]	Uses place value relationships, familiar number patterns, single digit number facts, and deconstructing numbers and recombining them, when undertaking mental calculations. [In] [T]		Q7	Pattern and algebraic reasoning	3.9 Describes and generalises relationships between measurable attributes as patterns and explains the impact of varying one aspect of the relationship. [F] [T] [KC1] [KC2]	represents relationships between measurable attributes using materials, diagrams, databases, point and line graphs, and mathematical statements [T] [KC1]		Q18
				Q8					Q19
				Q9					Q20
Measurement	3.4 Selects appropriate attributes and systems to measure for a variety of purposes and reports on how measurement is used in social practice. [In] [T] [C] [KC1] [KC2]	Chooses and uses metric units to compare, measure and analyse figures, objects and events in various social contexts [T] [KC1] uses the appropriate metric Units to measure capacity, volume, and angle (ie m3, cm3 to measure capacity; mL, L to measure volume; degrees to measure angles) [T]		Q11	Design Brief		Level 4	Level 3	Level 2
				Q12	The Design Brief is a task aimed at consolidating all of the concepts in Q1 - 22 and applying them creatively, to a practical situation.		Highly engaged. Minimal assistance indicating concepts understood	Engaged. Some assistance indicating concepts understood	Easily distracted. Needed intervention indicating support needed to understand concepts.
				Q13					
				Q14					
				Q15	Design Brief not attempted				





Q4. How many adults and children could he invite? List 3 combinations below.

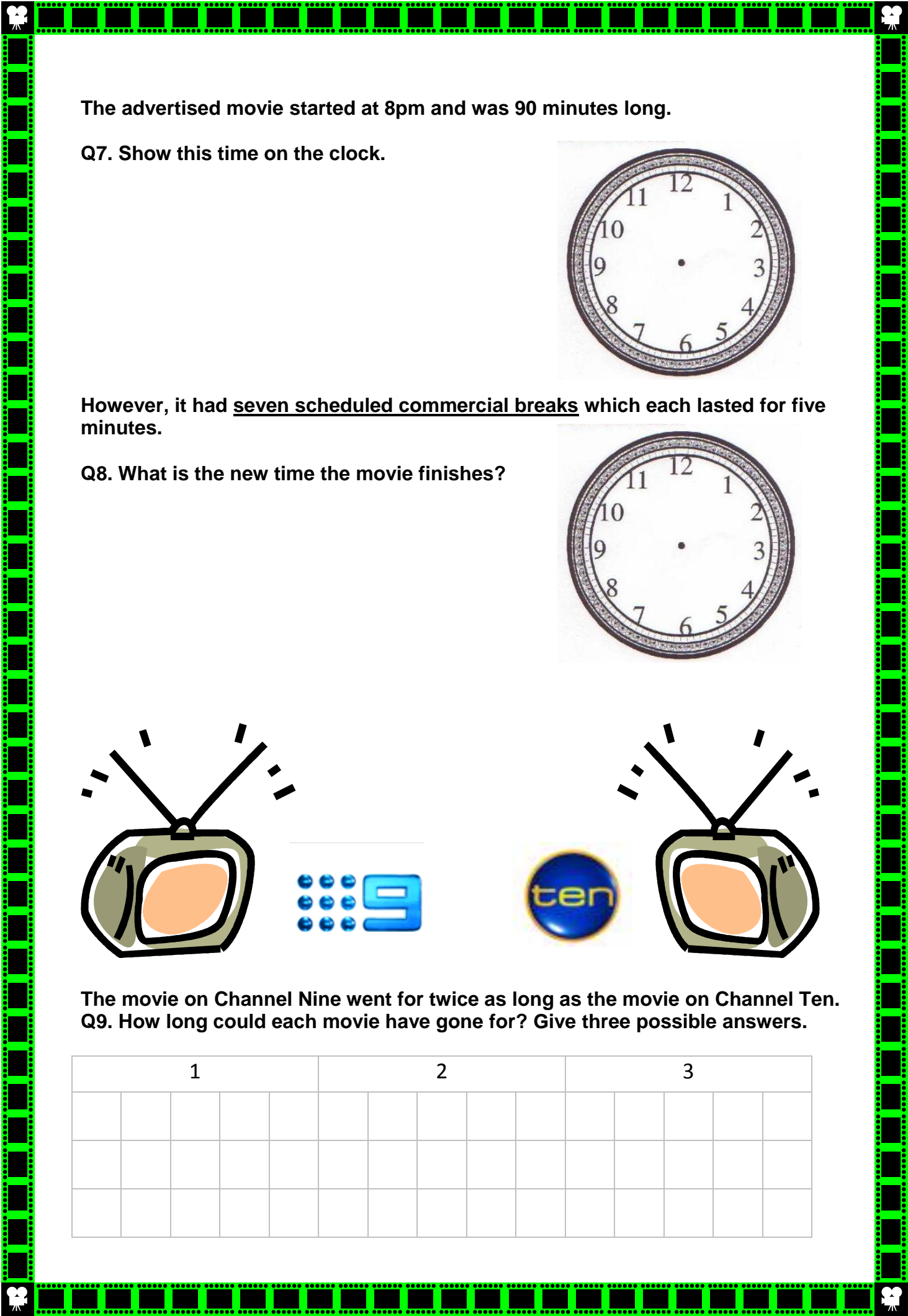
[illegible]

Q5. How much did each item cost?

(Hint: Your answer must total \$23.55 exactly.)

Q6. What combination of notes and coins might he have used?



[illegible][illegible]

The advertised movie started at 8pm and was 90 minutes long.

Q7. Show this time on the clock.

However, it had seven scheduled commercial breaks which each lasted for five minutes.

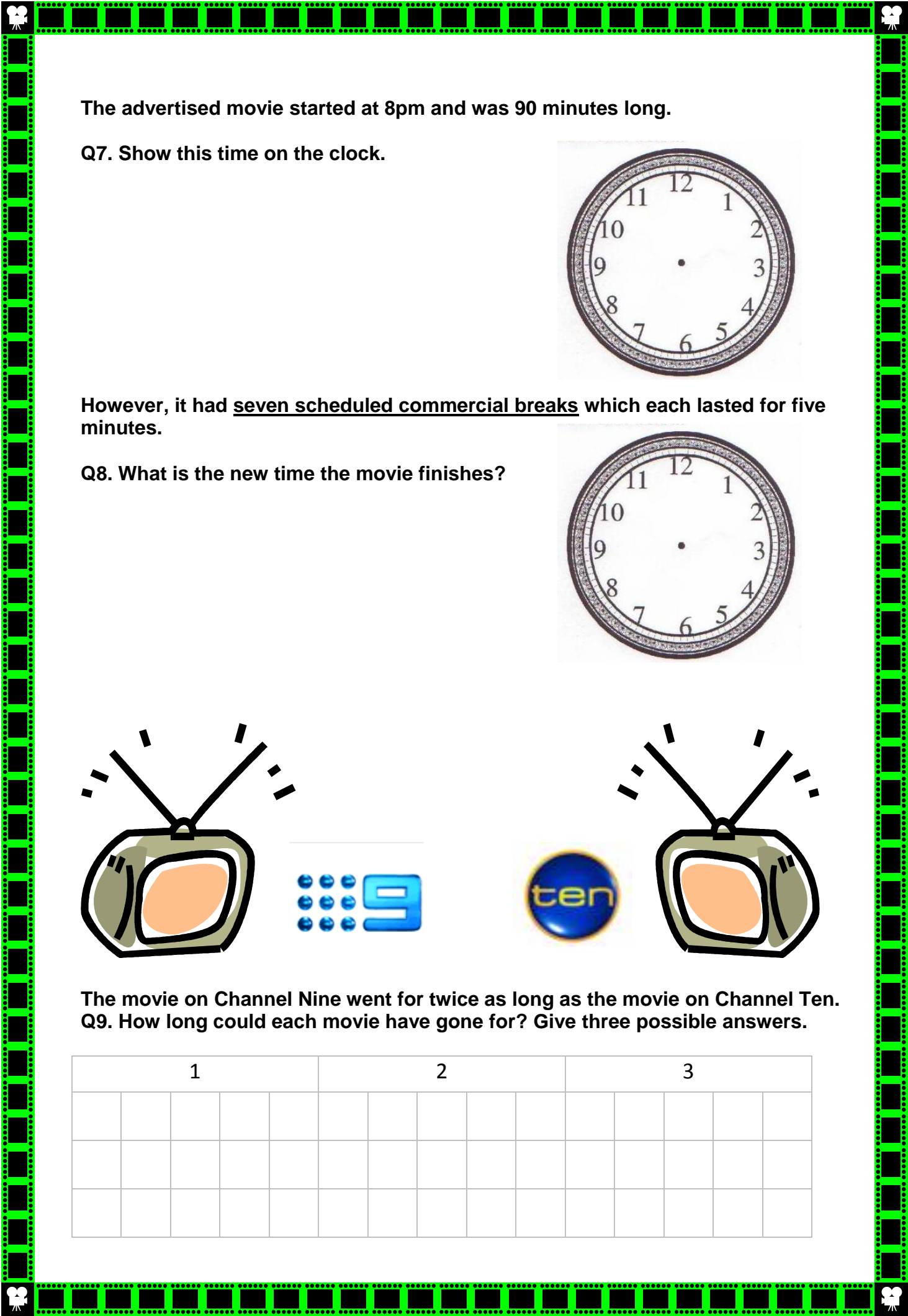
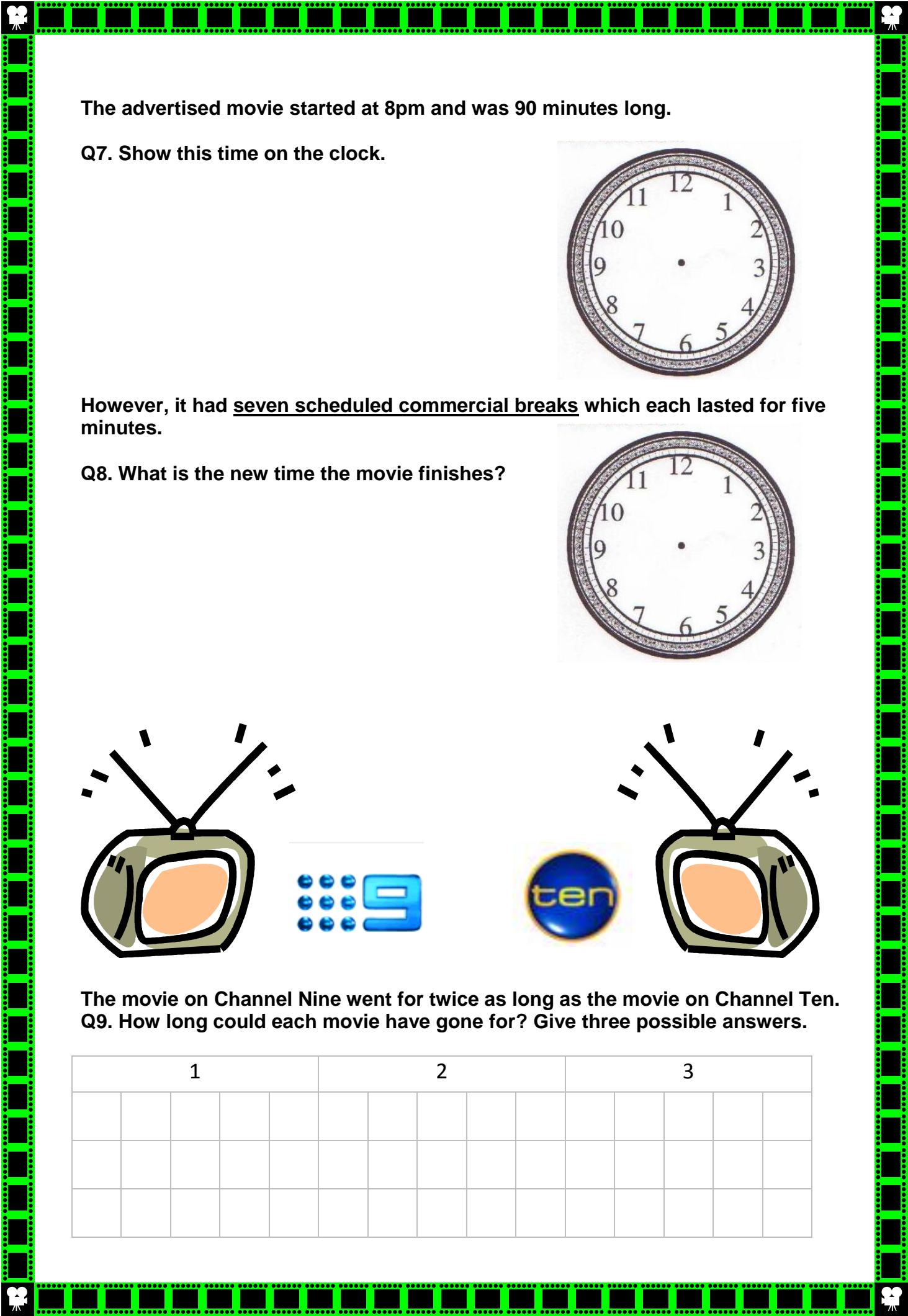
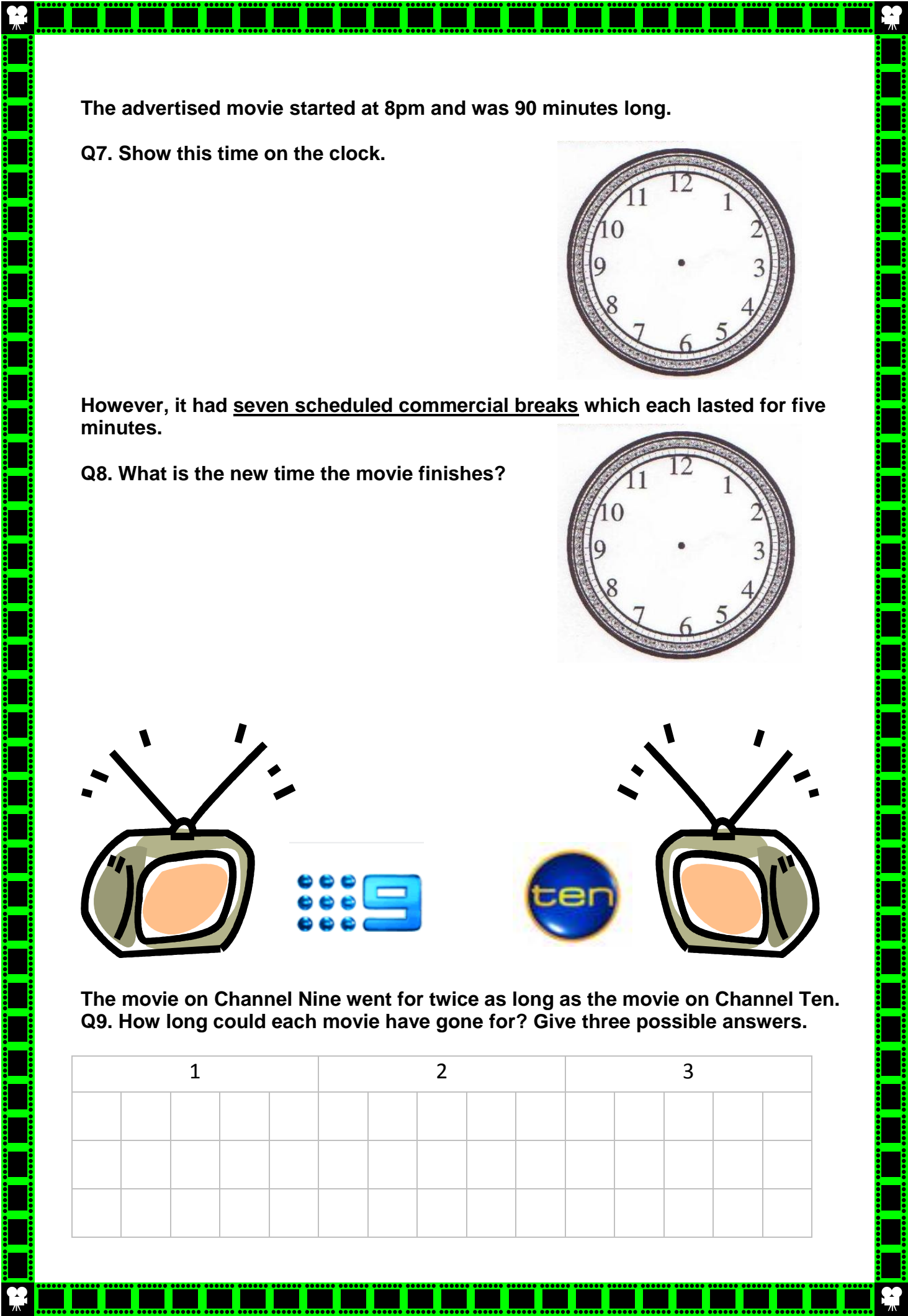
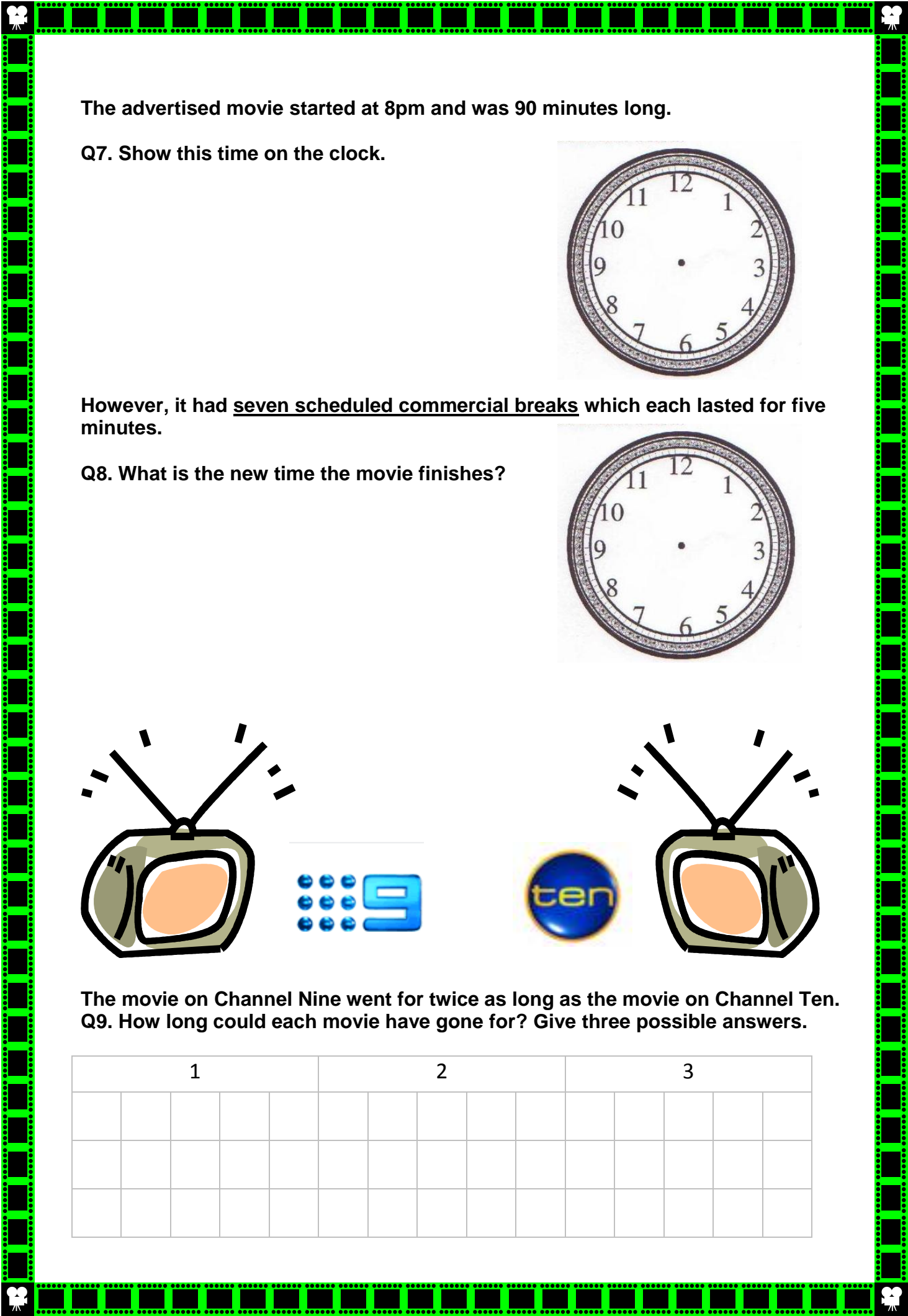
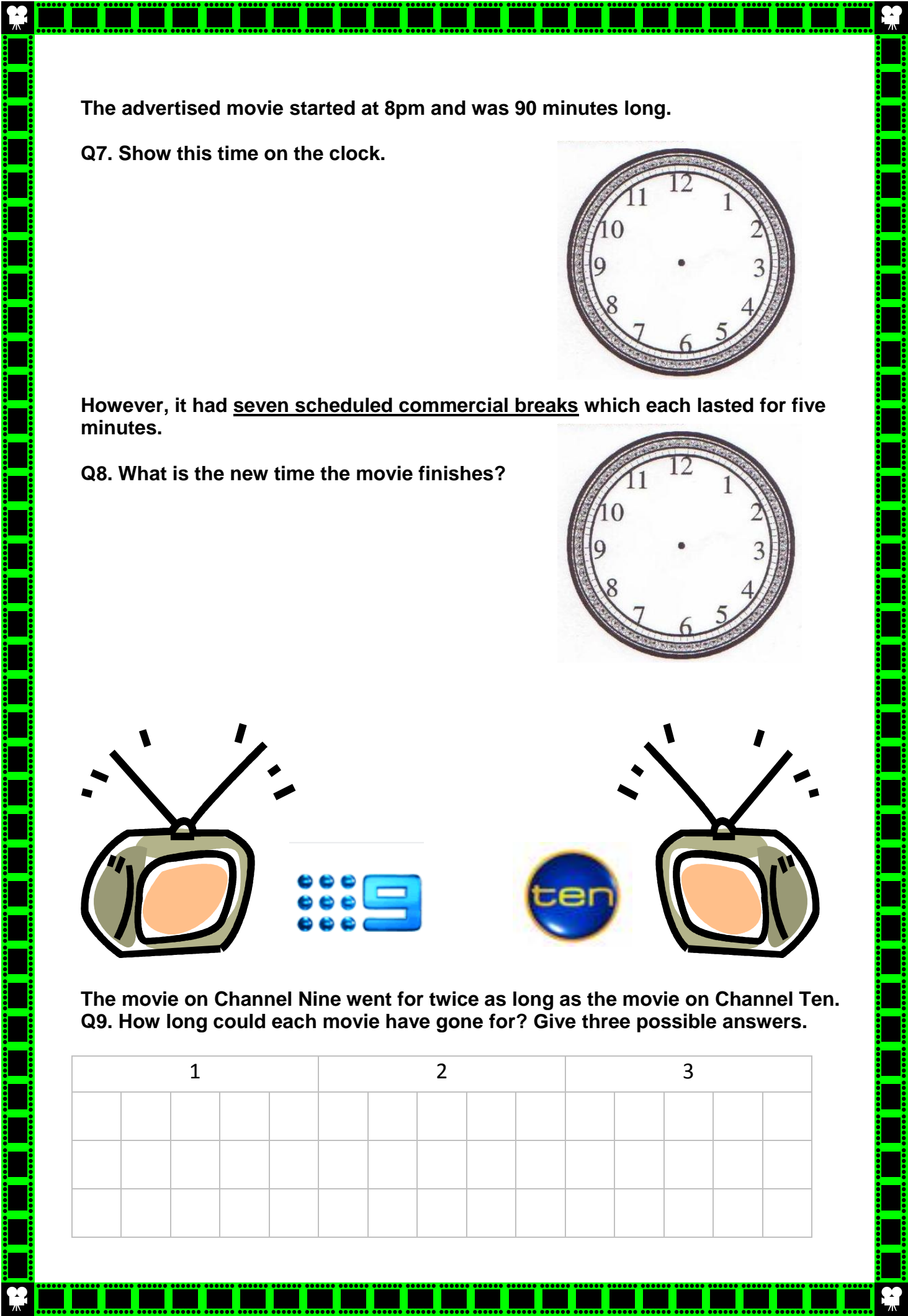
Q8. What is the new time the movie finishes?

The bottom section contains two cartoon TVs. The left TV has the Channel Nine logo next to it, and the right TV has the Channel Ten logo next to it.

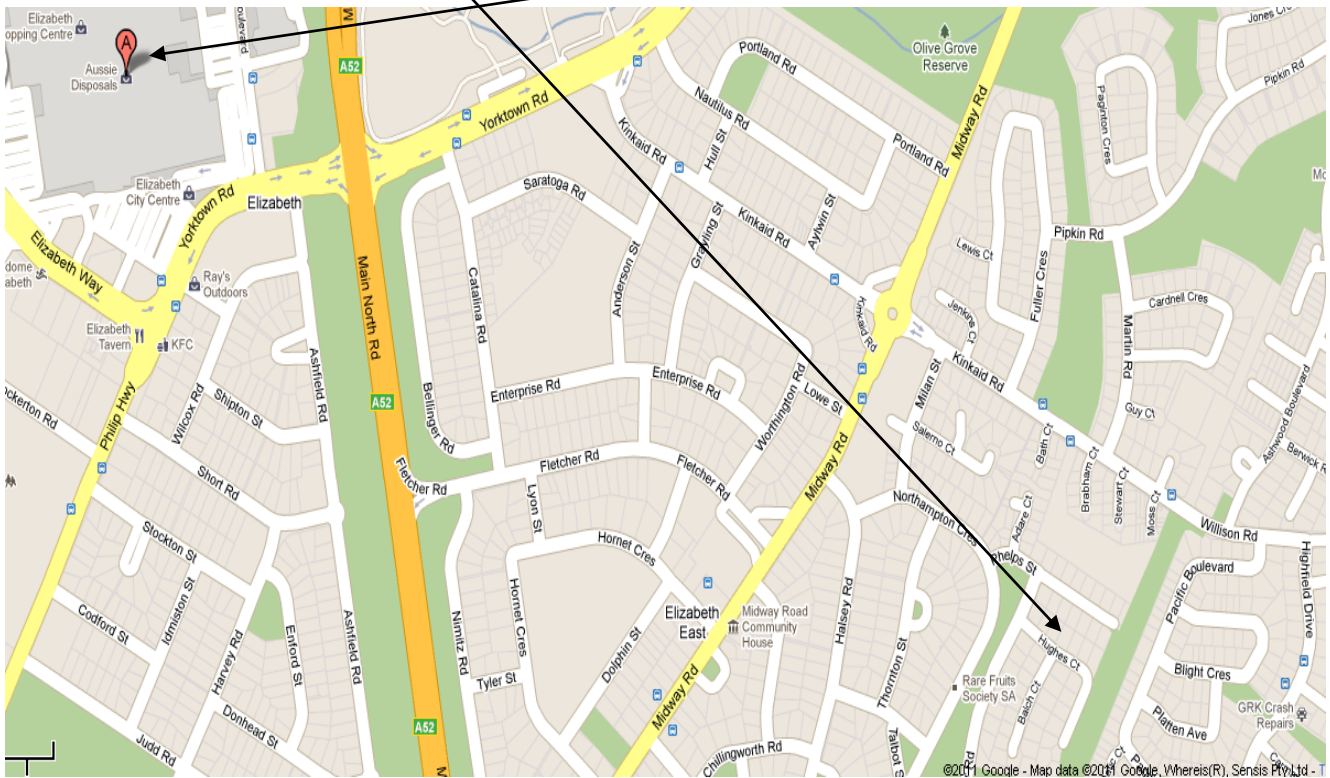
The movie on Channel Nine went for twice as long as the movie on Channel Ten.

Q9. How long could each movie have gone for? Give three possible answers.

1					2					3				

[illegible][illegible]

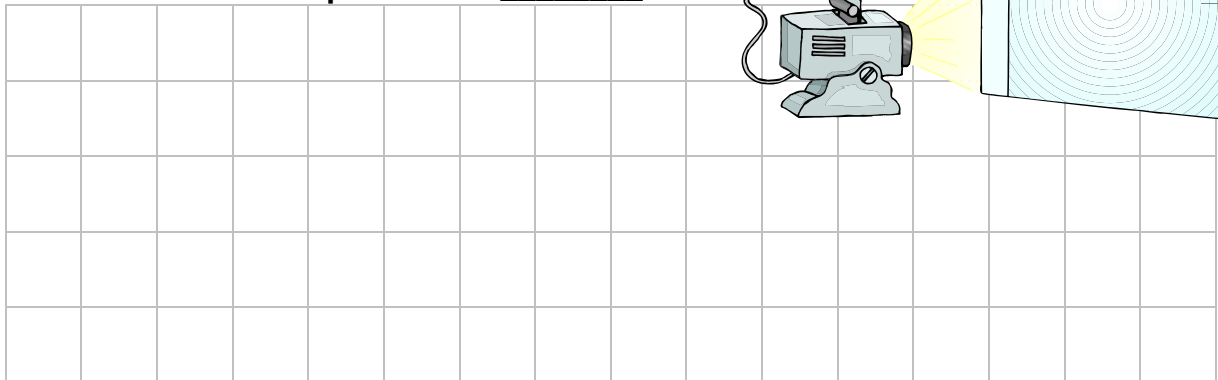
Q10. Draw the quickest route to the Reading Cinema at Elizabeth.



A movie screen measures 10 metres along the base and is 6 metres high.

Q11. What is the area? _____m²

Q12. What is the perimeter? _____m



In a theatre complex, the total theatre (100%) floor dimensions are 200 metres by 100 metres.

- **80% of the total floor area includes the five movie theatres.**

Q13. What is the area (in square metres) of the five movie theatres?

- The remaining 20% of the cinema area includes the foyer, snack bar, toilets and arcade games.

Q14. How many square metres (m²) is this space?

These five movies are showing at the Reading Cinemas:

The Fast and Furious (140 mins),
Thor (125 mins),
Insidious (112 mins),
Source Code (105 mins)
Something Borrowed (118 mins).

Q15. What is the average length of these movies?

When film reviewers rate movies they often give it a number out of five. For example, an entertaining movie might get a four or five star rating and a poor movie might get just one or two.

This system is actually using fractions.

Q16. Complete this rating table:

Star rating (out of five)	Fraction	Converted	Converted
☆☆☆☆	$\frac{4}{5}$	$\frac{\quad}{10}$	$\frac{\quad}{100}$
☆	$\frac{\quad}{5}$	$\frac{\quad}{10}$	$\frac{\quad}{100}$
☆☆☆	$\frac{\quad}{5}$	$\frac{\quad}{10}$	$\frac{\quad}{100}$

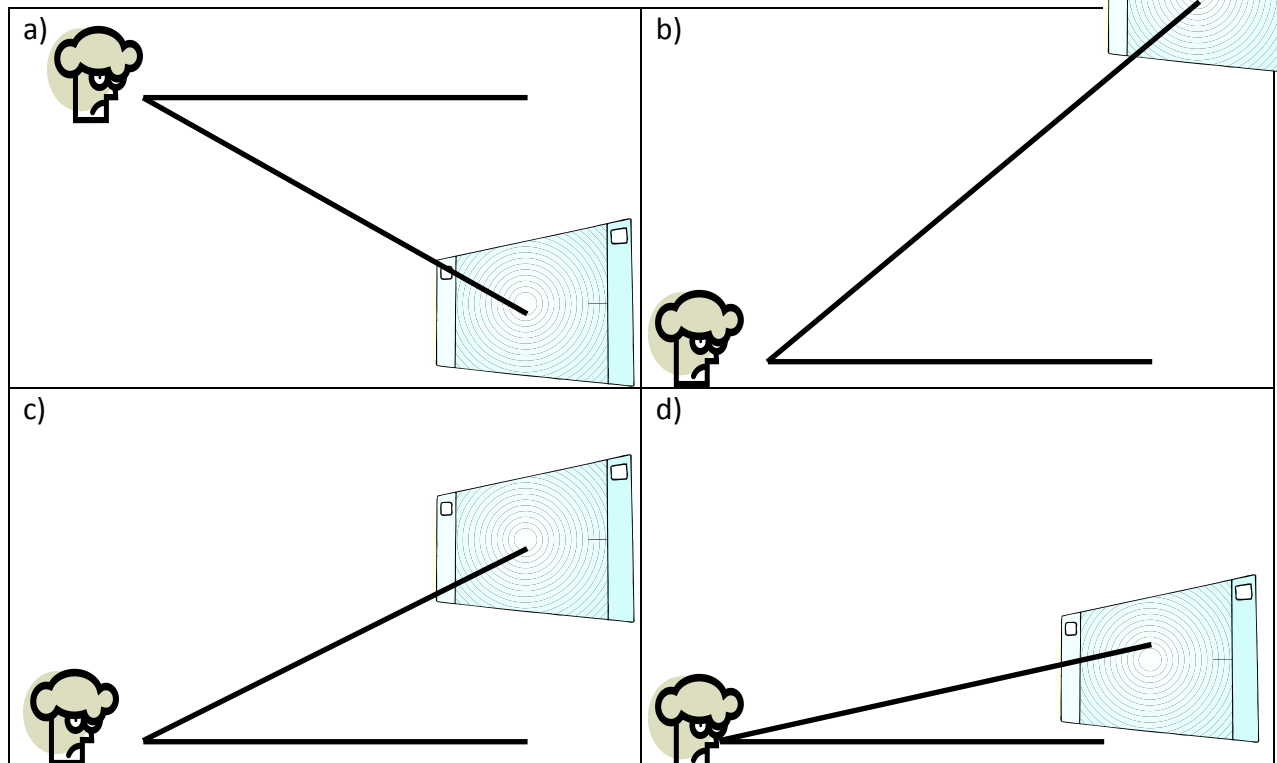
1

- 1



People generally don't like sitting in the front rows of a cinema because the angle is awkward.

Q18. Which is the best angle to view the movie?



Q19. If you were the person in a) – where would you be sitting?

Q20. If you were the person in b) – where would you be sitting?

Q21. Sort the angles in order, starting with the closest to the screen.

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Q22. Measure the angles

a) _____°	b) _____°	c) _____°	d) _____°
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Design Brief

It is the year 2055.

Cinemas and the film industry are becoming obsolete due to a lack of interest. As a movie lover, you create a survey to identify the cause of people's disinterest.

These are the results:

- People do not like sitting in formal rows.
- People suffering from headaches and migraines find it difficult to stare at the big screen for a length of time due to the angle of the screens in relation to the seats.
- The curtained or carpeted walls in the theatre are dull and boring.
- Not all people can see the screen.
- There is not enough leg room for tall people.
- People don't want to leave the cinema theatre to get drinks.



TASK:

Plan a futuristic movie theatre. Your theatre design must:

- Seat 100 people
- Address all the concerns that came up in the survey
- Present a new name for theatres in the next century. It must have 'cine' in the title

PROCESS:

- Use the graph paper provided and then plan your design.
(Enlarge to A3)
- You must show a bird's eye view of the theatre.

A **bird's eye view** is an elevated [view](#) of an object from above, with a [perspective](#) as though the [observer](#) were a [bird](#), often used in the making of [blueprints](#), [floor plans](#) and [maps](#). (Wikipedia)

- Use at least 10 different regular and/or irregular geometric shapes and angles.
- Classify the shapes: *i.e. regular pentagon, irregular quadrilateral.*

<http://www.mathsisfun.com/shape.html>

- Determine how much carpet is needed for the area of floor space
- Consider the scale: *i.e. – 1cm = 1 metre*
- Show the perimeter measurements of the room.

(Adapted from *Ready-Ed Publications*)

